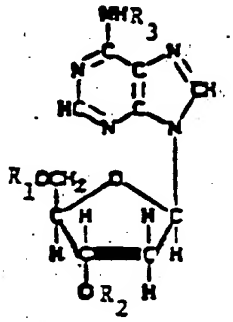
administering to said animal an effective amount of an acyl derivative of 2'-deoxyadenosine, having the formula



wherein R_1, R_2, and R_3 are the same or different and each is hydrogen or an acyl group derived from

(a) an unbranched fatty acid with 3 to 22 carbon atoms,

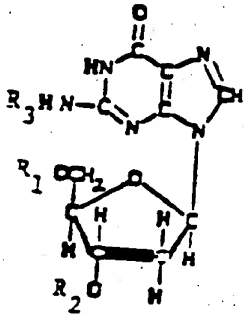
(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid having 3 to 22 carbon atoms, provided that not all of R_1, R_2, and R_3 are H, and where R_3 is not H, then R_1 and/or R_2 may also be acetyl, or a pharmaceutically acceptable salt thereof.

49. (New) A method of enhancing the delivery of exogenous deoxyribonucleosides to the tissue of an animal, comprising the step of

administering to said animal an effective amount of an acyl derivative of 2'-deoxyguanosine having the formula



wherein R_1, R_2, and R_3 are the same or different and each is hydrogen or an acyl group derived from

(a) an unbranched fatty acid with 3 to 22 carbon atoms,

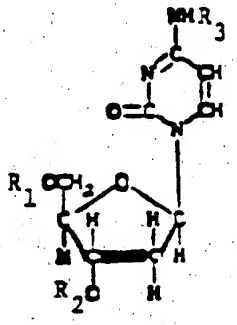
(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, phenylalanine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid having 3 to 22 carbon atoms, provided that not all of R_1, R_2, and R_3 are H, and where R_3 is not H, then R_1 and/or R_2 may also be acetyl, or a pharmaceutically acceptable salt thereof.

50. (New) A method of enhancing the delivery of exogenous deoxyribonucleosides to the tissue of an animal, comprising the step of

administering to said animal an effective amount of an acyl derivative of 2'-deoxycytidine, having the formula



wherein R_1, R_2, and R_3 are the same or different and each is hydrogen or an acyl group derived from

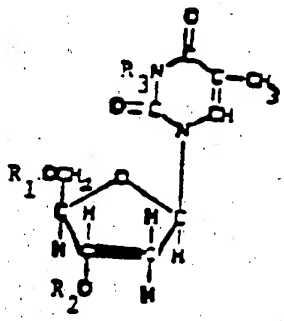
(a) an unbranched fatty acid with 3 to 22 carbon atoms,

(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid having 3 to 22 carbon atoms, provided that not all of R_1, R_2, and R_3 are H, and where R_3 is not H, then R_1 and/or R_2 may also be acetyl, or a pharmaceutically acceptable salt thereof.

51. (New) A method of enhancing the delivery of exogenous deoxyribonucleosides to the tissue of an animal, comprising the step of administering to said animal an effective amount of an acyl derivative of 2'-deoxythymidine, having the formula



wherein R_1 is an acyl group derived from

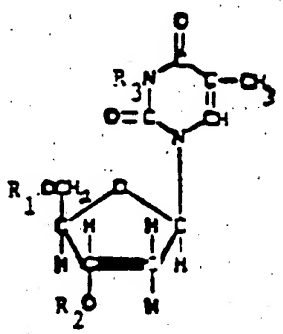
(a) an unbranched fatty acid with 3 to 15 or 17 to 22 carbon atoms,

(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid having 3 to 22 carbon atoms, and R_2 and R_3 are H, or a pharmaceutically acceptable salt thereof.

52. (New) A method of enhancing the delivery of exogenous deoxyribonucleosides to the tissue of an animal, comprising the step of administering to said animal an effective amount of an acyl derivative of 2'-deoxythymidine, having the formula



wherein R_1 is H, R_2 is an acyl group derived from

(a) an unbranched fatty acid with 3 to 13 or 15 to 22 carbon atoms,

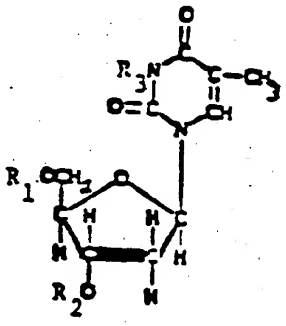
(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid with 3 to 22 carbon atoms, and R_3 is H or a pharmaceutically acceptable salt thereof.

B cont'd

53. (New) A method of enhancing the delivery of exogenous deoxyribonucleosides to the tissue of an animal, comprising the step of administering to said animal an effective amount of an acyl derivative of 2'-deoxythymidine, having the formula



wherein R_1 and R_2 are the same or different and each is an acyl group derived from

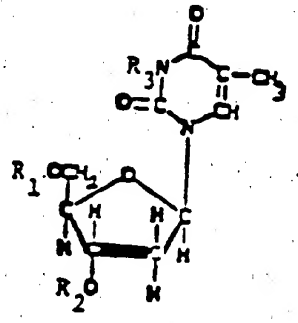
(a) an unbranched fatty acid with 5 to 22 carbon atoms,

(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid with 3 to 22 carbon atoms, and R_3 is H or a pharmaceutically acceptable salt thereof.

54. (New) A method of enhancing the delivery of exogenous deoxyribonucleosides to the tissue of an animal, comprising the step of administering to said animal an effective amount of an acyl derivative of 2'-deoxythymidine, having the formula



B' cont'd

wherein R_1 and R_2 are the same or different and each is an acyl group derived from

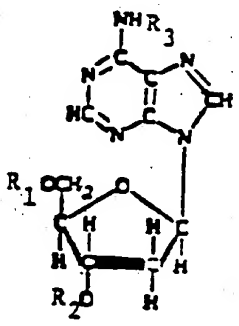
(a) an unbranched fatty acid with 2 to 22 carbon atoms,

(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

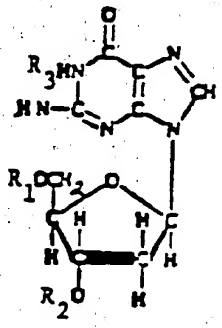
(c) nicotinic acid or

(d) a dicarboxylic acid with 3 to 22 carbon atoms, and R_3 is an acyl group derived from an optionally substituted benzoyl or heterocyclic carboxylic acid that is substantially nontoxic, or a pharmaceutically acceptable salt thereof.

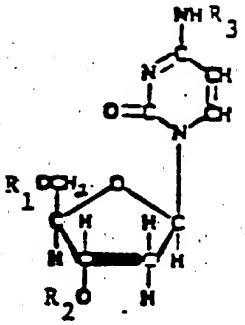
55. (New) A method of enhancing the delivery of exogenous deoxyribonucleosides to the tissue of an animal, comprising the step of administering to said animal an effective amount of each of at least two compounds selected from at least two of the groups of compounds having formulae



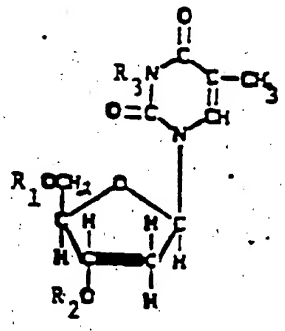
(I)



(II)



(III)

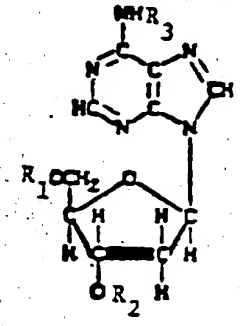


(IV)

wherein R_1, R_2, and R_3 are the same or different and each is H or an acyl group derived from a carboxylic acid, provided that at least one of said

substituents R_1, R_2, and R_3 on each of said groups of compounds is not hydrogen, or pharmaceutically acceptable salts thereof.

56. (New) A method for treating or preventing radiation-induced cellular damage or sunlight-induced cellular damage comprising administering to an animal an effective amount of a composition comprising an acyl derivative of 2'-deoxyadenosine, having the formula



B1 cont'd

wherein R_1, R_2, and R_3 are the same or different and each is hydrogen or an acyl group derived from

(a) an unbranched fatty acid with 3 to 22 carbon atoms,

(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline,

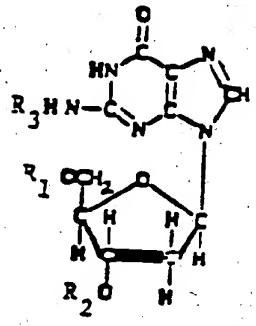
serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid having 3 to 22 carbon atoms, provided that not all of R_1, R_2, and R_3 are H, and where R_3 is not H, then R_1 and/or R_2 may also be acetyl, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

57. (New) A method for treating or preventing radiation-induced cellular damage or sunlight-induced cellular damage comprising administering to an animal an effective amount of a composition comprising an acyl derivative of 2'-deoxyguanosine having the formula

B' cont'd



wherein R_1, R_2, and R_3 are the same or different and each is hydrogen or an acyl group derived from

(a) an unbranched fatty acid with 3 to 22 carbon atoms,

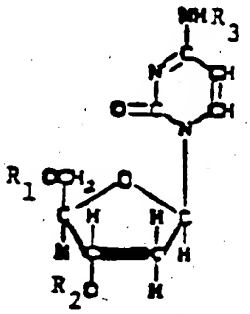
(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, phenylalanine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid having 3 to 22 carbon atoms, provided that not all of R_1, R_2, and R_3 are H, and where R_3 is not H, then R_1 and/or R_2 may also be acetyl, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

B' cont'd

58. (New) A method for treating or preventing radiation-induced cellular damage or sunlight-induced cellular damage comprising administering to an animal an effective amount of a composition comprising an acyl derivative of 2'-deoxycytidine, having the formula



wherein R_1, R_2, and R_3 are the same or different and each is hydrogen or an acyl group derived from

(a) an unbranched fatty acid with 3 to 22 carbon atoms,

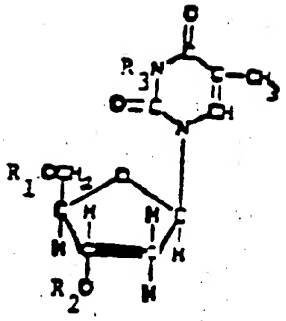
(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid having 3 to 22 carbon atoms, provided that not all of R_1, R_2, and R_3 are H, and where R_3 is not H, then R_1 and/or R_2 may also be acetyl, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

B' cont'd

59. (New) A method for treating or preventing radiation-induced cellular damage or sunlight-induced cellular damage comprising administering to an animal an effective amount of a composition comprising an acyl derivative of 2'-deoxythymidine, having the formula



wherein R_1 is an acyl group derived from

(a) an unbranched fatty acid with 3 to 15 or 17 to 22 carbon atoms,

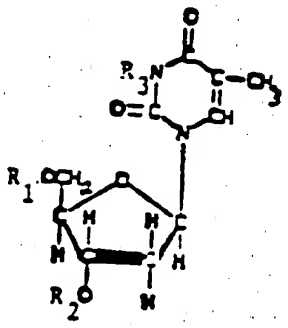
(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid having 3 to 22 carbon atoms, and R_2 and R_3 are H, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

60. (New) A method for treating or preventing radiation-induced cellular damage or sunlight-induced cellular damage comprising administering to an

animal an effective amount of a composition comprising an acyl derivative of 2'-deoxythymidine, having the formula



wherein R_1 is H, R_2 is an acyl group derived from

(a) an unbranched fatty acid with 3 to 13 or 15 to 22 carbon atoms,

(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

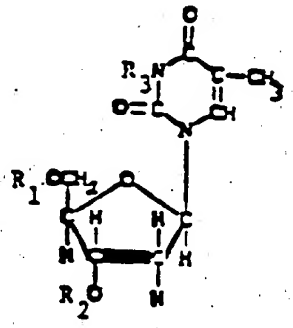
(c) nicotinic acid, or

(d) a dicarboxylic acid with 3 to 22 carbon atoms, and R_3 is H or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

B1 contd

61. (New) A method for treating or preventing radiation-induced cellular damage or sunlight-induced cellular damage comprising administering to an

animal an effective amount of a composition comprising an acyl derivative of 2'-deoxythymidine, having the formula



wherein R_1 and R_2 are the same or different and each is an acyl group derived from

(a) an unbranched fatty acid with 5 to 22 carbon atoms,

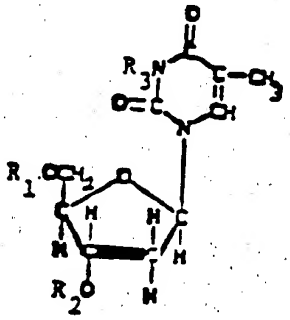
(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine; cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

(c) nicotinic acid, or

(d) a dicarboxylic acid with 3 to 22 carbon atoms, and R_3 is H or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

B1 cont'd

62. (New) A method for treating or preventing radiation-induced cellular damage or sunlight-induced cellular damage comprising administering to an animal an effective amount of a composition comprising an acyl derivative of 2'-deoxythymidine, having the formula



B cont'd

wherein R_1 and R_2 are the same or different and each is an acyl group derived from

(a) an unbranched fatty acid with 2 to 22 carbon atoms,

(b) an amino acid selected from the group consisting of glycine, the L forms of alanine, valine, leucine, isoleucine, tyrosine, proline, hydroxyproline, serine, threonine, cysteine, aspartic acid, glutamic acid, arginine, lysine, histidine, carnitine, and ornithine,

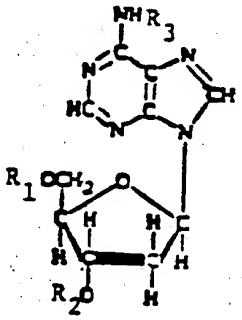
(c) nicotinic acid or

(d) a dicarboxylic acid with 3 to 22 carbon atoms, and R_3 is an acyl group derived from an optionally substituted benzoyl or heterocyclic carboxylic

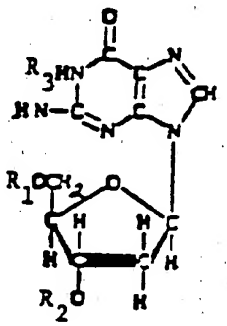
acid that is substantially nontoxic, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

63. (New) A method for treating or preventing radiation-induced cellular damage or sunlight-induced cellular damage comprising administering to an animal an effective amount of a composition comprising an effective amount of each of at least two compounds selected from at least two of the groups of compounds having formulae

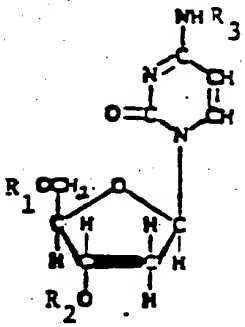
B11 cont'd



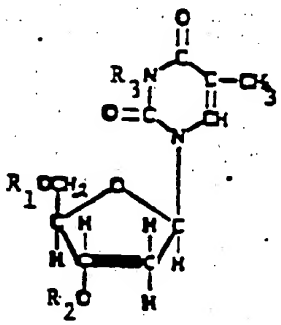
(I)



(II)



(III)



(IV)

wherein R_1, R_2, and R_3 are the same or different and each is H or an acyl group derived from a carboxylic acid, provided that at least one of said substituents R_1, R_2, and R_3 on each of said groups of compounds is not hydrogen, or pharmaceutically acceptable salts thereof, and a pharmaceutically acceptable carrier.

B' concld